HELIX™ UNIVERSAL GATEWAY CONFIGURATION GUIDE
RealNetworks Technical Blueprint Series
Revision Date: 21 July 2002

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HELIX™ UNIVERSAL GATEWAY CONFIGURATION GUIDE

Welcome

Welcome to Helix ™ Universal Gateway from RealNetworks.® The Helix Universal Gateway provides, an integrated solution that combines all of functionality of Helix ™ Universal Server from RealNetworks ® to receive content at the edge, and an application level proxy-cache for caching and splitting content from the public Internet. By distributing content closer to end users, enterprise and service providers can increase delivery scalability, reduce bandwidth costs, and improve quality of service. This flexible application is the ideal behind-the-firewall solution, perfect for corporate enterprises, education and government deployments, and for Content Distribution Networks (CDNs) and Service providers distributing content to the edge.

As soon as you install both subsystems of Helix Universal Gateway they are ready to stream media.

Audience

This configuration guide details the installation steps necessary to run the Helix Universal Gateway's server and proxy subsystems on a single machine. It also introduces you to the administration interface for each software component as it relates to the dual installation process.

This document is targeted at system administrators, architects, and technology managers interested in deploying Helix Universal Gateway for any of the following purposes:

- Branch offices for receiving managed content from an upstream server

- Branch offices for receiving and caching un-managed content from the public Internet

- Content Distribution Network for receiving content at the edge (these deployments will typically only install the server subsystem and may not have the need to install the proxy subsystem).

While the Helix Universal Gateway is sold as one product, it does require two separate software installations, one for the server delivery subsystem, and another for the proxy-caching subsystem. The installation section of this guide specifically addresses common configuration options related to IP address bindings and each application's administration tools.

This guide assumes an advanced understanding of network architecture, IP protocols, and firewall security, as well as familiarity with the streaming media technologies developed at RealNetworks.

Before you install, you need to make basic set-up and deployment decisions about IP address bindings, as described in the "Understanding Deployment Issues" section. Port, Caching, Splitting and Security Configurations can be completed after the IP binding process, without any additional considerations.

For additional configuration and usage information, please refer to the administration guides for the server and proxy subsystems integrated within the their respective Administration systems or at http://service.real.com/help/library/index.htm. The ReadMe file is continuously updated; you can always find the most up-to-date version of it at http://service.real.com/help/library/index.htm.

Documentation Conventions

For More Information: Throughout this document "server subsystem" and "Helix Universal Server" are referring to the same application. The same naming convention holds true for "proxy subsystem" and "Helix Universal Proxy."

Warning! The IP addresses of 197.168.0.100 and 10.0.0.200 used in this document as examples are fictitious! You will need to have two available IP addresses from your network before starting the Helix Universal Gateway installation process.

Tip: The loopback *(localhost)* IP address of 127.0.0.1 in this documentation is correct and will be assigned to the proxy subsystem.

Note: A lowercase, italicized '*x*' are used for each numeral is a value portrayed in sample command line syntax. For instance, "7832" would be shown as "*xxxx*."

Deployment Scenarios

The installation of the proxy and server subsystems on a single machine is especially well suited for smaller branch (satellite) office operations where enterprises, public agencies, and educational institutions desire to cache and receive content at the edge of their networks in these distributed locations. The single-machine application of Helix Universal Gateway, at the satellite office, can consist of two common content distribution scenarios, each dominated by one of the Gateway subsystems.

Content Caching at the Network Edge

In this scenario the branch office receives content from outside the firewall. In this case the proxy subsystem acts to control how much content is "pulled" from the Internet, as well as caching and re-serving it. In this deployment, there are three very important objectives to meet:

- Bandwidth optimization. Optimize enterprise bandwidth use for digital media. Conserve bandwidth use across costly links that connect the enterprise's wide area network (WAN) to the Internet, and also conserve bandwidth use across dedicated links that connect remote offices to the primary corporate network.

- Security. Allow digital media traffic onto corporate networks without compromising strict enterprise security. Filter or authenticate end-user access to this streaming media content, and ensure that employees comply with corporate policies regarding media consumption.

- Quality of service. Provide the highest possible quality of service for digital media to enterprise end users, for both locally hosted and remotely hosted broadcasts.
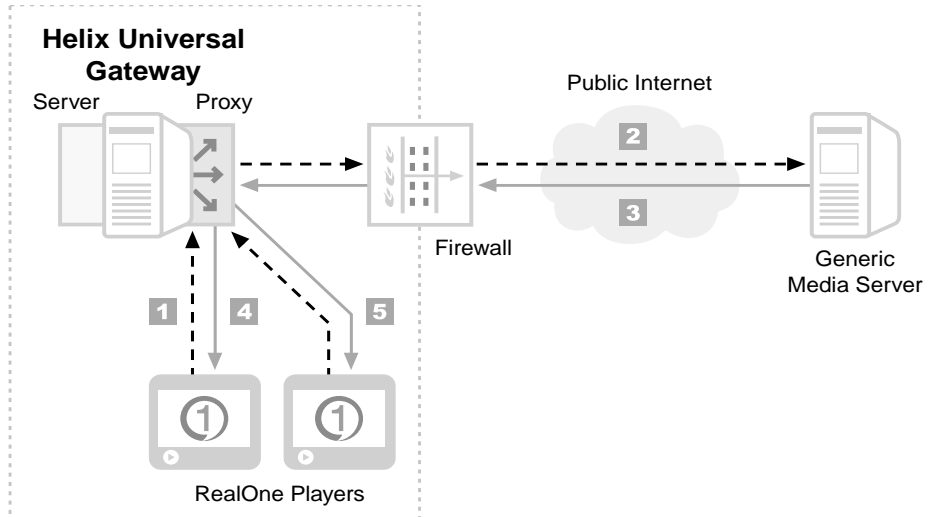
Figure 1: Content Caching at the Network Edge

➤ Figure 1 Explanation

1. User makes request for media on public Internet via the gateway proxy subsystem.

2. Gateway proxy subsystem fulfills (pulls) requests from original server outside the firewall.

3. Gateway proxy subsystem caches content in local directory.

4. Gateway proxy subsystem delivers content to user.

5. Subsequent requests for the same piece of content are fulfilled out of the proxy subsystem cache.

Receiving Content at the Network Edge

In this scenario the branch office receives live and on-demand content, which is "pushed" and "pulled" to the branch office by the gateway server subsystem.

> **Note:** For locations receiving high volumes of content, you should consider installing the server and proxy subsystems on separate machines.
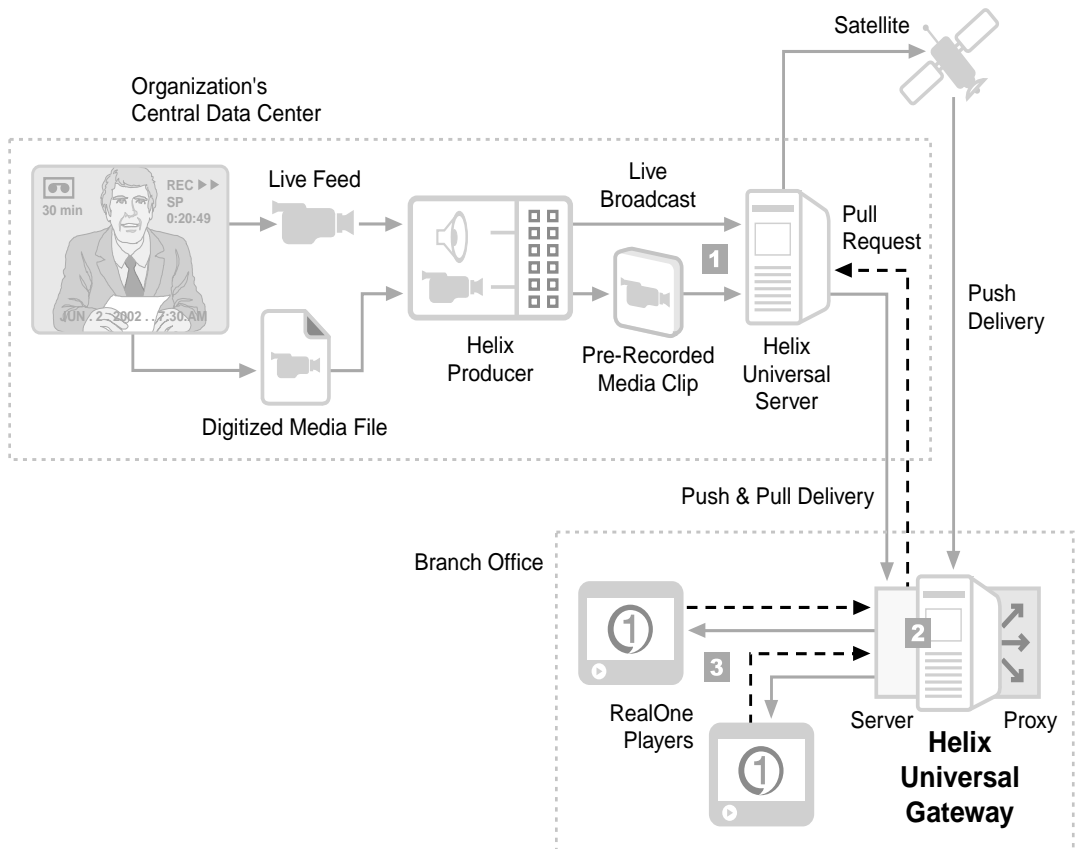
Figure 2: Receiving Content at the Network Edge

Figure 2 Explanation

1. Content is pre-loaded (pushed) on to the Gateway server subsystem at the network edge.

2. The content is received by the Gateway server subsystem and store in the server cache.

3. Users then request content directly from the Gateway server subsystem cache, which then pulls the content directly from the Gateway server subsystem.

> **Note:** Content requests from the local server subsystem continue to be routed through the proxy subsystem.

System Requirements

Helix^{TM} Universal Gateway System Requirements

Requirement	
Minimum CPU Speed	550-773 MHz
Minimum RAM	512 MB (combined for both applications)
Recommended RAM	1024 MB (combined for both applications)
Disk Space	The Helix Universal Gateway requires about 20 MB of storage plus storage for your media

Understanding Deployment Issues

Before you install the Gateway, you need to make basic set-up and deployment decisions that will affect how you configure your Helix Universal Gateway. This guide assumes the following parameters for installing the Helix Universal Gateway on one computer:

- Two software installation packages, one for server subsystem and one for the proxy subsystem, will be installed on single machine that has either one or multiple network interface cards (NICs) and is configured with two or more IP addresses.

> **Tip:** If you plan to install the server and proxy subsystems on separate machines, ignore the steps explained in this guide! Use the installation and configuration instructions furnished in the separate administration guides for Helix Universal Server and Helix Universal Proxy.

- A unique IP address will be assigned to the server subsystem and the proxy subsystem, separately.

- The Helix Universal Gateway will not share a computer with a Web server.

- The Helix Universal Gateway will reside behind the corporate firewall.

- The loopback address will be assigned to the proxy subsystem.

- The internal software heart beat mechanism will be assigned to the IP address of the server subsystem.

DCHP and LANs

Warning! Dynamic Host Configuration Protocol should not be used when configuring IP addresses for the Helix Universal Server and Helix Universal Proxy. Both applications will assigned a unique static IP address in procedures described later in this guide.

Determining Which NIC Address to Bind With

If your system is already multi-homed and you are unclear as to which LAN/WAN network interface card (NIC) you need to bind the server and proxy subsystems to, RealNetworks recommends that the proxy should be bound the IP address of the interface to which proxy-users will connect, and the server should be bound to the IP address of the interface on the network that they wish content to be made available to.

Capturing All Addresses

RealNetworks recommends that you do not capture all addresses for either Helix Universal Server or Helix Universal Proxy's use, when installing both application son one machine!

Normally this is done by specifying the IP address 0.0.0.0, and deleting all others. Helix Universal Server or Helix Universal Proxy will then automatically bind to all addresses and to localhost. For most installations, RealNetworks recommends binding to all addresses.

Binding to Specific Addresses

If you bind Helix Universal Server to one or more specific addresses, Helix Universal Server binds only to those address, but not to others. In other words, it will not bind to localhost.

To bind to a specific address and to localhost, you must add both to the IP binding list. This will be the case when you establish the IP bindings for Helix Universal Proxy during your Helix Universal Gateway installation in the section "*Step 7: Binding Helix Universal Proxy To An IP Address*" of this guide.

Web Servers and Helix Universal Server

Warning! RealNetworks suggests that you do not install Helix Universal Gateway on the same physical machine that runs your Web server.

For More Information: For information on the use of Web servers, HTTP Port Resolution, and Web Server MIME types, consult the "Installation and QuickStart" chapter of the Helix Universal Server Administration Guide.

Firewalls with Server and Proxy

For More Information: See the "Firewalls" chapter of the Helix Universal Server Administration Guide, and Helix Universal Proxy Administration Guide.

Getting Started

Essential Items

Before starting your installation of the server and proxy subsystems, you **must** have the following resources ready and tasks completed.

- ❑ Both product installer binaries
- ❑ Two XML license files
- ❑ Appropriate (root) privileges on the host system
- ❑ A system that is configured with multiple IP addresses
- ❑ Decide which product will be bound to which address

Warning! Do not proceed with the installation of either subsystem until items on the above list have been completed. If you are unclear about how to add multiple IP addresses to a single-homed system, consult the section of this guide titled *"Adding Virtual IP Addresses to Windows, Solaris, and Linux Systems,"* or review your operation systems vendor's documentation.

Installation Process

The procedure for installing both the server subsystem and the proxy subsystem on one machine with two IP addresses is the same, regardless of whether the machine has one or two network interface cards (nics). The numbered steps below describe the overall sequence you must follow to get both subsystems of the Helix Universal Gateway installed. Once both subsystems are installed, you can configure the IP Binding for each product in the application's Administrator pages or by editing the `rmserver.cfg` and `rmproxy.cfg` files, respectively.

Installation Steps Overview

➤ This installation sequence must be followed exactly.

> **Tip:** Make a note of which Administration port is used for the server and proxy. Both subsystems will assigned different port numbers. These notes will be referenced later when you go to open Helix Administrator with a web browser.

1. Install the Helix Universal Server software.

2. Start the Helix Universal Server.

3. Bind Helix Universal Server to its unique IP addresses.

4. Shutdown the Helix Universal.

5. Install the Helix Universal Proxy software.

6. Start the Helix Universal Proxy.

7. Bind Helix Universal Proxy to the unique IP addresses you want it to run on.

8. Bind the loopback address for Helix Universal Proxy to `127.0.0.1`

9. Start the Helix Universal Server with the heart beat interface (`--hbi`) explicitly set to its address.

10. Start the Helix Universal Proxy normally.

> **Tip:** A QuickStart version of this installation sequence that uses XML `rmserver.cfg` and `rmproxy.cfg` files is available at the end of this document.

Step 1: Installing Helix Universal Server

To install Helix Universal Server, you need a binary installation file and a license file, which enables Helix Universal Server features. Although you can install Helix without the license file, Helix Universal Server will not operate until you have obtained a valid license file. License files are delivered by e-mail after you download or purchase Helix Universal Server.

> **Note:** If you're installing on UNIX, you have to log in as root to perform a default installation because the default value for the RTSP port is lower than 1024.

> **Warning!** RealNetworks recommends, initially, not installing Helix Universal Server as a Windows Service. By installing the server subsystem as an application, you have the benefit of being able to visually confirm that the startup sequence in the application's console window. When the server subsystem is installed as an application, the application's console window displays after the Helix Universal Server has been double-clicked on the desktop.

➤ To install Helix Universal Server:

1. Launch the Helix Universal Server binary setup file you downloaded. If you have a Helix Universal Server installation CD, open the folder named for the operating system you are using, and double-click the setup file.

2. Read the installation recommendations and press **Enter**.

3. Enter the path to the license file you received from RealNetworks, and press **Enter**. The installation process copies the license file to the License subdirectory under the main Helix Universal Server directory. On startup, Helix Universal Server reads that copy of the license.

4. Read the end-user license agreement, signifying your agreement to its terms by pressing **Enter**.

5. Enter a path where you want to install Helix Universal Server, or accept the default. Examples in this guide assume that you've chosen the default path.

6. Enter a user name and password, and then confirm your password by entering it again. Your user name and password are required to access various Helix Universal Server features, such as Helix Administrator.

Choose a password that is difficult to guess, and that includes both letters and numbers. The password is case-sensitive.

7. In the next set of screens, you define ports that Helix Universal Server uses for the PNA, RTSP, HTTP, and MMS protocols, as well as the port used by Helix Administrator. RealNetworks recommends accepting the default ports, unless those port values will cause conflicts with other applications.

> **Note:** It is acceptable to have PNA, RTSP, HTTP, and MMS port numbers that conflict between Helix Universal Proxy and Helix Universal Server because each application will be running on different IP addresses.

Note the following:

- You can change the port settings later, as described in the "Server Setup" chapter of the Helix Universal Server Administration Guide.

- If you use a nonstandard port for a streaming protocol, you will need to include the port number in URLs, as described in the "Server Setup" of the Helix Universal Server Administration Guide. For more information about streaming protocols, see the "Firewalls" chapter of the Helix Universal Server Administration Guide.

- You do not need to configure transport-layer protocols such as TCP and UDP. Helix Universal Server and the client automatically select the transport protocol. After installation, you can restrict the UDP port range, as described in "Server Setup" chapter of the Helix Universal Server Administration Guide. For background on TCP and UDP, see the "Firewalls" chapter of the Helix Universal Server Administration Guide.

- You will need the Admin port number to connect to Helix Administrator from a Web browser. As a security feature, the installer randomly generates this port number. RealNetworks recommends that you accept the default, but you may change the port value if you wish, or you know that the selected value will conflict with another port assignment. In either case, remember the port number, or record it in a secure location.

8. On Windows, the default installation sets up Helix Universal Server as a service. This is not recommended and you can prevent this by clearing the **Run as NT Service** check box.

> **For More Information:** If you choose, you can later set up Helix Universal Server to run as a Windows service, as described in the "Installation and QuickStart" chapter of the Helix Universal Server Administration Guide.

9. In the final confirmation screen, review and accept the installation information to complete the installation process.

Unix Installation Verification

For UNIX installations you have successfully completed the Server installation when you see "cleaning up installation files....done" followed by "Helix Universal Server installation is complete" on the command line of the console window.

Windows Installation Verification

A pop-up window titled **Setup of Helix Server** will display with the message, "Helix Server installation is complete" to notify you of a successful installation.

Troubleshooting Server Installation

By using the default port settings for the server subsystem, you can avoid multiple installation problems. In the event that there is a conflict with the machine your are installing the server on, the system will identify the port in conflict and ask you whether you want to change the conflicting port configuration, now, or continue without making the change. Deferring this decision will still require you address the port conflict later.

Server License File Information

> **For More Information:** See the "Installation and QuickStart" chapter of the Helix Universal Server Administration Guide.

Step 2: Starting Helix Universal Server

This section describes how to Helix Universal Server on Windows and UNIX. It lists command line options that you can use when starting Helix Universal Server manually.

When you start Helix Universal Server manually, you can select which configuration file you want to use. You can also specify command line options on both Windows and UNIX.

Starting on Windows

In its default Windows installation, Helix Universal Server is set up as service named "Helix Server." In this case, Helix Universal Server always runs in the background, and you do not need to start it. If you did not install Helix Universal Server as a Windows service, you can start it from the **Start** menu or the command line.

> **Tip:** By installing the server subsystem as an application, you have the benefit of being able to visually confirm that the startup sequence in the application's console window. When the server subsystem is installed as an application, the application's console window displays after the Helix Universal Server has been double-clicked on the desktop.

Starting from the Start Menu

From the **Start** menu, select **Programs>Helix Server**. Helix Universal Server loads the default configuration file, rmserver.cfg.

Starting from the Command Line

From the **Start** menu, open the command prompt. Navigate to the Helix Universal Server folder, and enter the following command to start Helix Universal Server with its default configuration file. You can use a different configuration file if you wish:

```
Bin\rmserver rmserver.cfg
```

Starting on UNIX

If you performed a default installation of Helix Universal Server, the RTSP port is set lower than 1024, requiring the user who starts Helix Universal Server to log in as root. If you do not want Helix Universal Server to inherit root privileges, you can switch Helix Universal Server to another user and

group name immediately after it starts up. For instructions, refer to the "Server Setup" chapter of Helix Universal Server Administration Guide.

> **Note:** The HTTP port is also set below 1024, at 80. For more information about the HTTP port setting see the "Server Setup" chapter in the Helix Universal Server Administration Guide.

You can start Helix Universal Server as an application or as a background process. The following procedure uses the default configuration file (rmserver.cfg), but you can specify a different file. If your machine has multiple processors, first see the "Installation and QuickStart" chapter of the Helix Universal Server Administration Guide.

➤ **To Start Helix Universal Server on UNIX:**

1. Start any command shell.

2. Navigate to the main Helix Server installation directory.

> **Warning!** If you do not start Helix Universal Server from its Bin directory, it cannot resolve the relative paths in the configuration file.

3. Start Helix Universal Server as an application:

   ```
   Bin/rmserver rmserver.cfg
   ```

Unix Start Up Verification

For UNIX installations you have successfully complete the Server installation when you see the following message:

```
Start PIT xxxx, procnum xx <Streamer>
```

Windows Start Up Verification

For Windows installations you have successfully complete the Server installation when you see the following message in the console window:

```
Start PIT xxxx, procnum xx <Streamer>
```

Troubleshooting Server StartUp

If the server subsystem identifies a port conflict, you should do one of the following:

- Reinstall the server subsystem and select a non-conflicting port

- Shutdown

- Reassign the port being used by the conflicting application

Step 3: Binding Helix Universal Server To An IP Address

When Helix Universal Server starts, it uses the IP address assigned to the first network interfaces it finds on the computer—network interface 0. In a computer with multiple network interfaces—often referred to as a *multi-homed* machine—you can configure Helix Universal Server always to use specific IP addresses. Through this feature, you can select individual IP addresses to use.

By default, Helix Universal Server binds to the *localhost* address (also called the *loopback* address), which enables a simulated network connection from Helix Universal Server to a client installed on the same computer. When using this address, which is useful for testing, no information is sent over the network, but it appears as if the connection came from the network. You can express this address in dotted decimal form as 127.0.0.1.

> **Warning!** See Instructions in step 2 of Binding to a New IP Address to ensure Server is **NOT** connected to the *localhost* (loopback) address.

If you bind Helix Universal Server to one or more specific addresses, Helix Universal Server binds only to those address, but not to others. In other words, it will not bind to localhost. To bind to a specific address and to localhost, you must add both to the IP binding list.

Server IP Address (example)
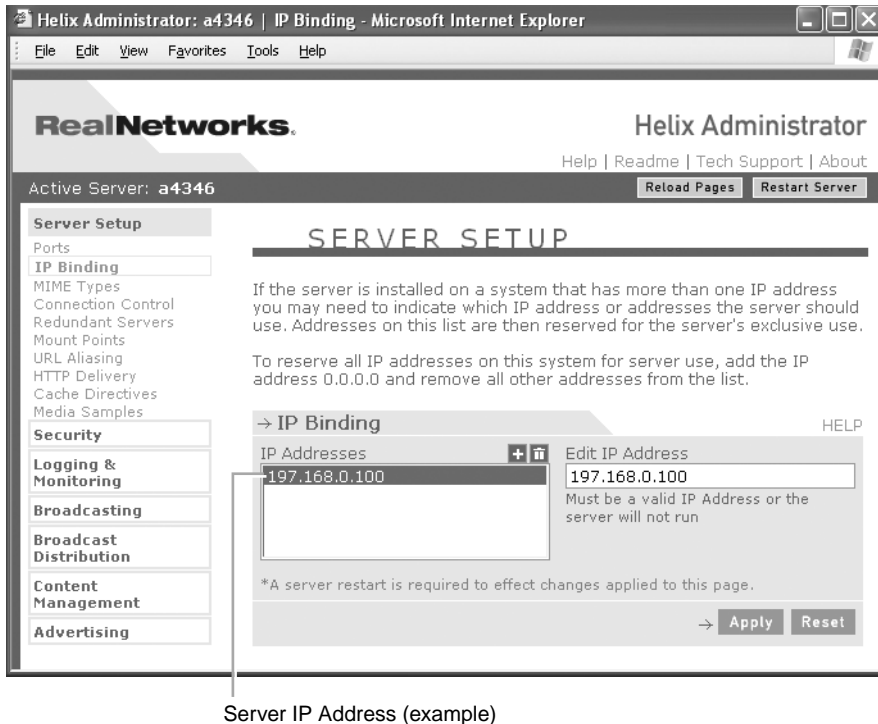
Figure 3: Helix Administrator page for server subsystem setup.

Binding Helix Universal Server to a New IP Addresses

You can bind Helix Universal Server to an IP address using Helix Administrator.

➤ **To assign a new IP address for Helix Universal Server:**

1. Start Helix Administrator by typing the following address in a Web browser: http://*address:AdminPort*/admin/index.html

   Note: If your browser is on the same computer as Helix Universal Server, you can typically use the localhost address:

   http://localhost:*AdminPort*/admin/index.html

2. Enter the user name and password chosen during installation. The password is case-sensitive.

3. Click **OK** to start Helix Administrator.

> **Tip:** You can create additional user names and passwords to let other people access Helix Administrator. For more information, see the "authentication" chapter of the Helix Universal Server Administration Guide.

4. In Helix Administrator, click **Server Setup> IP Binding**.

> **Warning!** By default the **Edit IP Address** box is empty and the system will bind the Helix Universal Server to the computer's primary IP address and the localhost's address. To configure the Gateway, the IP addresses for Helix Universal Server must different from the localhost.

5. Click the "**+**" icon and type the new IP address that you want Helix Universal Server to use into the **Edit IP Address** box.

> **Tip:** The new IP address you selected must be reserved the server subsystem's use only.

> **Warning!** Make a note of the IP address you assigned to Helix Universal Server. This new address will now become part of the address syntax (Step 1, above) when you access the Helix Administrator the next time, and all subsequent times.
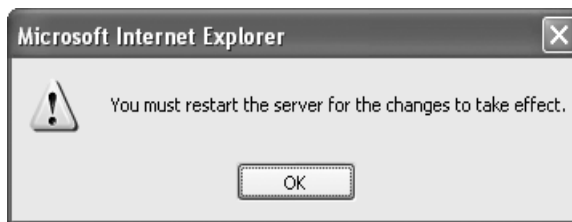
Figure 4: When you get this window, ignore the restart reminder message and close it.

6. Click **Apply** to save the changes.

> **Warning!** Ignore the Helix Administrator's pop-up window, which reminds you to restart the server to save your configuration changes. In "Step 10: Starting Helix Universal Server After A Shutdown" of his guide you will be instructed to

start the server subsystem manually, with the hbi. By doing this your IP binding changes will also be saved.

7. Click **Close Window** in the confirmation dialog box.

> **Note:** The GUI for Helix Administrator does not have a button for closing (shutting down) the server. See the next section for Server shutdown instructions.

UNIX and Windows Binding Verification

A window titled "Configuration Change Results" will appear and indicate that previous IP bindings have been successfully removed, along with a confirmation that the Address_1 for the Server has been "Set to 197.168.0.100".

Property	Action Taken	Status
IPBindings	Removed	Succeeded
Address_1	Set to 197.168.0.100	Succeeded
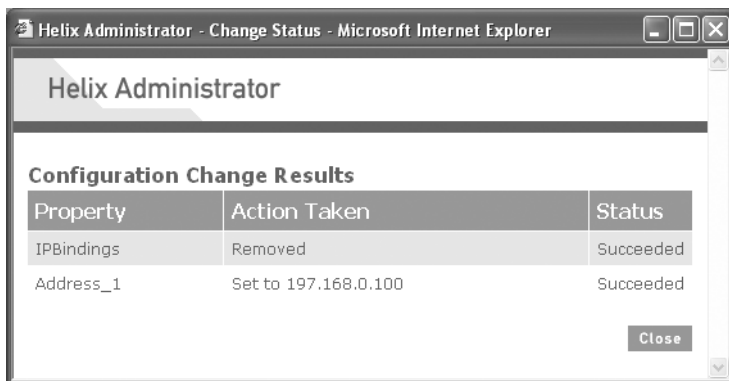
Figure 5: The 'Configuration Changes Results" window for the server subsystem shows the status of recent IP binding changes.

Troubleshooting IP Binding

The "Configuration Change Results" window will notify you of which binding processes or address conflicts have occurred.

Step 4: Stopping Helix Universal Server

This section describes how to stop Helix Universal Server on a Windows and UNIX systems. It lists command line options that you can use when stopping Helix Universal Server manually.

It's generally not necessary to stop Helix Universal Server when it's running. To successfully install the proxy subsystem it is necessary to stop the server subsystem.

> **Warning!** Failure to stop the server subsystem may result in an error message during the proxy subsystem installation that states there is a port conflict and Helix Universal Proxy cannot be installed.

Shutting Down on Windows

If Helix Universal Server was started as a Windows service, stop it through the **Services** control panel. Give the **Start>Settings>Control Panel** command and double-click **Services**. Locate Helix Server on the list (your service name may be different), highlight it, and click **Stop**.

If you started Helix Universal Server manually, switch to the command window and press **Ctrl+c**. You can also use the Task Manager (**Ctrl+Alt+Del**) to end the Helix Server task.

Shutting Down on UNIX

To stop Helix Universal Server on UNIX, obtain the parent process identification number, and then issue the kill command with that process number. The process ID is stored in the rmserver.pid file, which is usually kept in the Logs directory. (The PIDPath variable in the configuration file specifies this location.) You can perform both actions with one command. From the command line, navigate to the directory that contains the Helix Universal Server PID file, and type the following, where *pidfile* is the name of the PID file:

kill 'cat *pidfile*'

Unix and Windows Shutdown Verification

Typically the application's console windows will close when shutdown.

Troubleshooting Server Shutdown

With Windows you can also use the Windows Task Manager to see if the application is still running. For a UNIX system you can use the process viewer (ps command), each with their own specific command line options. Or, you can run top to make sure all eight to 12 rmserver.exe processes have ceased.

Step 5: Installing Helix Universal Proxy

To install Helix Universal Proxy, you need a binary installation file and a license file, which enables Helix Universal Proxy features. Although you can install Helix Universal Proxy without the license file, Helix Universal Proxy will not operate until you have obtained a valid license file. License files are delivered by e-mail after you download or purchase Helix Universal Proxy.

Note: If you're installing on UNIX, you have to log in as root to perform a default installation because the default value for the RTSP port is lower than 1024.

Warning! RealNetworks recommends, initially, not installing Helix Universal Proxy as a Windows Service. By installing the proxy subsystem as an application, you have the benefit of being able to visually confirm that the startup sequence in the application's console window. When the proxy subsystem is installed as an application, the application's console window displays after the Helix Universal Proxy has been double-clicked on the desktop.

➤ To install Helix Universal Proxy:

1. Launch the Helix Universal Proxy binary setup file you downloaded. If you have a Helix Universal Proxy installation CD, open the folder named for the operating system you are using, and execute the setup file.

2. Read the installation recommendations and press **Enter**.

3. Enter the path to the license file you received from RealNetworks, and press **Enter**. The installation process copies the license file to the License subdirectory under the main Helix Universal Proxy directory. On startup, Helix Universal Proxy reads that copy of the license.

4. Read the end-user license agreement, signifying your agreement to its terms and conditions by pressing **Enter**.

5. Enter a path where you want to install Helix Universal Proxy, or accept the default. Examples in this guide assume that you've chosen the default path.

6. Enter a user name and password, and then confirm your password by entering it again. Your user name and password are required to access various Helix Universal Proxy features, such as Helix Administrator.

Choose a password that is difficult to guess, and that includes both letters and numbers. The password is case-sensitive.

7. In the next set of screens, you define ports that Helix Universal Proxy uses for the PNA, RTSP, HTTP, and MMS protocols, as well as the port used by Helix Administrator. RealNetworks recommends accepting the default ports, unless those port values will cause conflicts with other applications.

> **Note:** Because the server and proxy subsystems will running on separate IP addresses it acceptable to use the same port numbers for the proxy subsystem's PNA, RTSP, HTTP, and MMS as the server subsystem.

Note the following:

- You can change the port settings later, as described in the "Proxy Setup" chapter of the Helix Universal Proxy Administration Guide.

- You will need the Admin port number to connect to Helix Administrator from a Web browser. As a security feature, the installer randomly generates this port number. RealNetworks recommends that you accept the default, but you can change the port value if you wish, or you know that the selected value will conflict with another port assignment. In either case, remember the port number, or record it in a secure location.

8. On Windows, the default installation sets up the proxy subsystem as a service. This is not recommended and you can prevent this by clearing the **Run as NT Service** check box.

> **For More Information:** If you choose, you can later set up Helix Universal Proxy to run as a Windows service, as described in the "Installation and QuickStart" chapter of the Helix Universal Proxy Administration Guide.

9. In the final confirmation screen, review and accept the installation information to complete the installation process.

Unix Installation Verification

For UNIX installations you have successfully complete the Proxy installation when you see "`cleaning up installation files....done`" followed by "`Helix Proxy installation is complete`" on the command line.

Windows Installation Verification

A pop-up window titled **Setup of Helix Proxy** will display with the message, "`Helix Proxy installation is complete`" to notify you of a successful installation.

Troubleshooting Server Installation

By using the default port settings for the proxy subsystem, you can avoid multiple installation problems. In the event that there is a conflict with the machine your are installing the proxy subsystem on, the system will identify the port in conflict and ask you whether you want to change the conflicting port configuration, now, or continue without making the change. Deferring this decision will still require you address the port conflict later.

Proxy License File Information

> **For More Information:** See the "Installation and QuickStart" chapter of the Helix Universal Proxy Administration Guide.

Step 6: Starting Helix Universal Proxy

This section describes how to start Helix Universal Proxy on Windows and Unix. It lists command line options that you can use when starting Helix Universal Proxy manually.

When you start Helix Universal Proxy manually, you can select which configuration file you want to use. You can also specify command line options on both Windows and UNIX.

Starting on Windows

In its default Windows installation, Helix Universal Proxy is set up as service named "Helix Proxy." In this case, Helix Universal Proxy always runs in the background, and you do not need to start it. If you did not install Helix Universal Proxy as a Windows service, you can start it from the **Start** menu, a desktop icon, or the command line.

Starting Up from the Start Menu

From the **Start** menu, select **Programs>Helix Proxy**. Helix Universal Proxy loads the default configuration file, rmproxy.cfg.

Starting Up from the Command Line

From the **Start** menu, open the command prompt. Navigate to the `Helix Proxy` folder, and enter the following command to start Helix Universal Proxy with its default configuration file. You can use a different configuration file if you wish:

```
Bin\rmproxy rmproxy.cfg
```

Starting on UNIX

You can start Helix Universal Proxy as an application or as a background process. The following procedure uses the default configuration file (`rmproxy.cfg`), but you can specify a different file.

> **Note:** If you performed a default installation of Helix Universal Proxy, the RTSP port is set lower than 1024, requiring the user who starts Helix Universal Proxy to log in as `root`.

➤ **To start Helix Universal Proxy on UNIX:**

1. Start any command shell.

2. Navigate to the main Helix Universal Proxy installation directory.

   > **Warning!** If you do not start Helix Universal Proxy from its `Bin` directory, it cannot understand the relative paths in the configuration file.

3. Start Helix Universal Proxy as an application:

   ```
   Bin/rmproxy rmproxy.cfg
   ```

Unix Start Up Verification

For UNIX installations you have successfully complete the proxy subsystem installation when you see the following message:

```
Start PID xxxx, procnum xx <Streamer>
```

Windows Start Up Verification

For Windows installations you have successfully complete the proxy subsystem installation when you see the following message in the console window:

```
Start PID xxxx, procnum xx <Streamer>
```

Troubleshooting Proxy Startup

If you encounter problems during startup please consult the "Troubleshooting Helix Universal Proxy" chapter in the Helix Universal Proxy Administration Guide.

Step 7: Binding Helix Universal Proxy To An IP Address

When Helix Universal Proxy starts, it uses the IP address assigned to the first network interface it finds on the computer—network interface 0. In a computer with multiple network interfaces—often referred to as a *multi-homed* machine—you can configure Helix Universal Proxy always to use specific IP addresses. Through this feature, you can select individual IP addresses to use, or you can bind to all the IP addresses on the machine.

By default, Helix Universal Proxy binds to the *localhost* address (also called the *loopback* address), which enables a simulated network connection from Helix Universal Server to a client installed on the same computer. When using this address, which is useful for testing, no information is sent over the network, but it appears as if the connection came from the network. You can express this address in dotted decimal form as 127.0.0.1.

To function properly, certain communications features of the proxy subsystem require the loopback address, while the server subsystem does not need the address.

> **Warning!** See Instructions in step 2, below, of "Binding Helix Universal Proxy to a New IP Address" to ensure Helix Universal Proxy is connected to the *localhost* (127.0.0.1) address.

If you bind Helix Universal Proxy to one or more specific addresses, Helix Universal Proxy binds only to those address, but not to others. In other words, it will not bind to localhost. To bind to a specific address and to localhost, you must add both to the IP binding list.
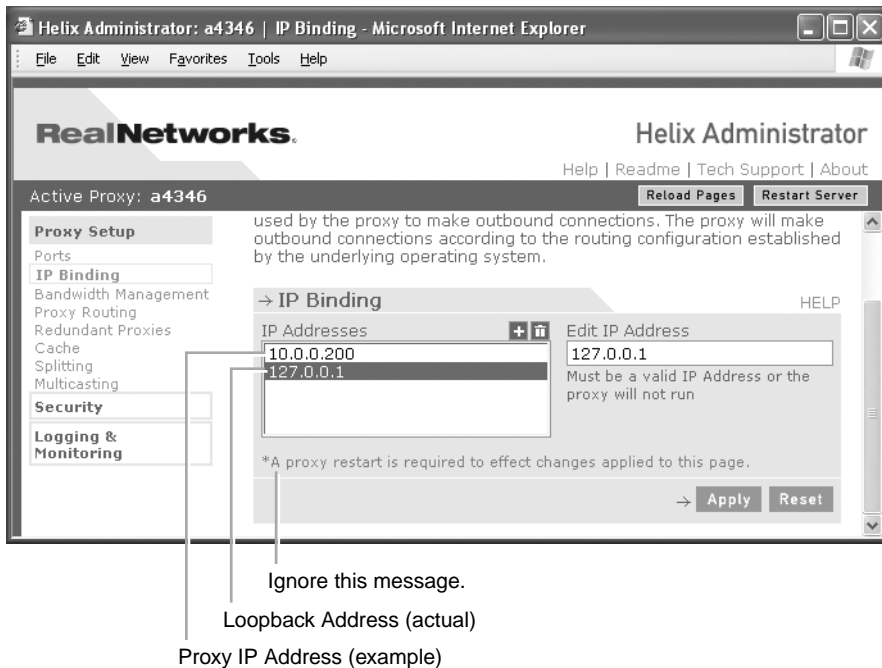
Figure 6: Helix Administrator page for proxy subsystem setup.

Binding Helix Universal Proxy to a New IP Addresses

You can bind Helix Universal Proxy to a new IP address using Helix Administrator.

➤ **To assign new IP addresses for Helix Universal Proxy:**

1. Click the browser shortcut created by the Helix Universal Proxy installer, or use the following instructions:

In a browser, use the following syntax:

`http://realproxy.example.com:AdminPort/admin/index.html`

where:

realproxy is the name of the machine on which Helix Universal Proxy is installed.

example.com is the name of the domain in which Helix Universal Proxy exists.

Optionally, rather than typing the name and domain of the system on which Helix Universal Proxy is installed, you can type the IP address.

AdminPort is the port which Helix Administrator uses to connect to Helix Universal Proxy. You are asked for a port number during setup. Use that port number here.

The following URL will start Helix Administrator if it is typed in the browser on the same computer as Helix Universal Proxy (be sure to substitute your port number for *AdminPort*):

`http://127.0.0.1:`*AdminPort*`/admin/index.html`

The following command also works on the same computer:

`http://localhost:`*AdminPort*`/admin/index.html`

2. Enter the user name and password chosen during installation. The password is case-sensitive.

3. Click **OK** to start Helix Administrator.

4. You can create additional user names and passwords to let other people access Helix Administrator. For more information, see the "Authentication of RealNetworks Proxy Users" chapter of the Helix Universal Proxy Administration Guide.

5. In Helix Administrator, click **Proxy Setup> IP Binding**.

> **Warning!** By default the **Edit IP Address** box is empty and the system will bind the Helix Universal Proxy to the computer's primary IP address and the localhost's address. To configure the Helix Universal Gateway, you must re-assign an address IP for the Helix Universal Proxy and the localhost functionality.

6. Click the "+" icon and type the new IP address that you want Helix Universal Proxy to use into the **Edit IP Address** box.

7. Click the "+" icon and type the localhost IP address of 127.0.0.1. into the **Edit IP Address** box.

> **Tip:** The new IP address you selected must be reserved the Helix Universal Proxy's use only.

> **Warning!** Make a note of the IP address you assigned to Helix Universal Proxy. This new address will now become part of the

address syntax (Step 1, above) when you access the Helix Administrator the next time, and all subsequent times.
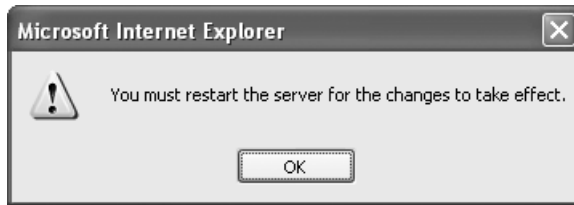
Figure 7: When you get this window, ignore the restart reminder message and close it.

8. Click **Apply** to save the changes.

> **Warning!** Ignore the Helix Administrator's popup window, which reminds you to restart the Proxy to save your configuration changes. In "Step 11: Starting Helix Universal Proxy After A Shutdown" of his guide you will be instructed to start the Proxy normally. By doing this your IP binding changes will also be saved.

9. Click **Close Window** in the confirmation dialog box.

> **Note:** The GUI for Proxy Administrator does not have a button for closing (shutting down) the server. See the next section for Server shutdown instructions.

UNIX and Windows IP Binding Verification

A window titled "Configuration Change Results" will appear and indicate that previous IP bindings have been successfully removed, along with a confirmation that the Address_1 for the Proxy has been "Set to 10.0.0.200", and Address_2   has been "Set to 127.0.0.1".
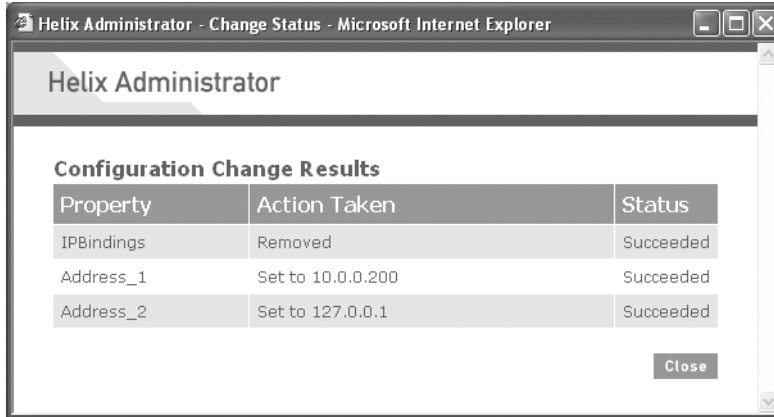
Figure 8: The 'Configuration Changes Results" window for the proxy subsystem shows the status of recent IP binding changes.

Troubleshooting IP Binding

The "Configuration Change Results" window will notify you of which binding processes or address conflicts have occurred. Confirm in this window that Address_2 for the Proxy has been "Set to 127.0.0.1".

> **For More Information:** If you encounter problems during IP Binding please consult the "Troubleshooting Helix Universal Proxy" chapter in the Helix Universal Proxy Administration Guide.

Step 9: Stopping Helix Universal Proxy

This section describes how to stop Helix Universal Proxy on Windows and Unix. It lists command line options that you can use when starting Helix Universal Proxy manually. Additionally, it explains how to configure Helix Universal Proxy as a Windows service if you did not select that option during installation.

It's generally not necessary to stop Helix Universal Proxy when it's running.

Shutting Down on Windows

If Helix Universal Proxy was started as a Windows service, stop it through the **Services** control panel. Give the **Start>Settings>Control Panel** command and double-click **Services**. Locate Helix Proxy on the list (your service name may be different), highlight it, and click **Stop**.

If you started Helix Universal Proxy manually, switch to the command window and press **Ctrl+c**. You can also use the Task Manager (**Ctrl+Shift+Esc**) to end the Helix Proxy task.

Shutting Down on UNIX

To stop Helix Universal Proxy on UNIX, obtain the parent process identification number, and then issue the kill command with that process number. The process ID is stored in the rmproxy.pid file, which is usually kept in the Logs directory. (The PIDPath variable in the configuration file specifies this location.) You can perform both actions with one command. From the command line, navigate to the directory that contains the Helix Universal Proxy PID file, and type the following, where *pidfile* is the name of the PID file:

kill 'cat *pidfile*'

Unix and Windows Shutdown Verification

The application's console window will close.

Troubleshooting Proxy Shutdown

With Windows you can also use the Windows Task Manager to see if the application is still running. For a UNIX system you can use the process viewer (ps command), each with their own specific command line options. Or, you can run top to make sure all eight to 12 rmproxy.exe processes have ceased.

Step 10: Starting Helix Universal Server After A Shutdown

This section describes how to start Helix Universal Server on Windows and UNIX with the Command Line tool, after the application is it has been previously shutdown. The default Helix Universal Server configuration will need to be modified to ensure that the internal software heart beat mechanism, also known as the "heart beat interface (hbi)" is only connected to the Helix Universal Server and not the Helix Universal Proxy. This mechanism verifies that the server subsystem is listening for incoming connections.

Starting UP on Windows from the Command Line

From the **Start** menu, open the command prompt. Navigate to the Helix Universal Server folder, and enter the following command to restart Helix Universal Server with the heart beat interface assigned to it.

```
Bin\rmserver rmserver.cfg --hbi <Server IP Address>
```

Starting Up on UNIX from the Command Line

If you performed a default installation of Helix Universal Server, the RTSP port is set lower than 1024, requiring the user who starts Helix Universal Server to log in as root. If you do not want Helix Universal Server to inherit root privileges, you can switch Helix Universal Server to another user and group name immediately after it starts up.

You must start Helix Universal Server as an application. The following procedure modifies the default configuration file (rmserver.cfg).

➤ **To restart Helix Universal Server on UNIX:**

1. Start any command shell.

2. Navigate to the main Helix Universal Server installation directory.

> **Warning!** If you do not start Helix Universal Server from its Bin directory, it cannot resolve the relative paths in the configuration file.

3. Choose one of the following options:

> **Warning!** If you fail to add the --hbi *<Server IP Address>* to the Bin/rmserver rmserver.cfg you will get an error message after 60-90 seconds stating:
>
> heartbeat failure1 step3
>
> Helix Server Heartbeat Failure Report
>
> When: *dd month year, time*
>
> Environment:*operating system-version number*-libc*x-xxxx*-server.--.*x.x.x.xxx*

> **Note:** The <Server IP Address> is the same one you designated the Server during the IP binding procedure.

a. Start Helix Universal Server in the background with the following command:

```
Bin/rmserver rmserver.cfg --hbi <Server IP Address> &
```

b. Start Helix Universal Server as an application:

```
Bin/rmserver rmserver.cfg --hbi <Server IP Address>
```

c. Optionally, you can limit the amount of memory that Helix Universal Server uses by including the -m parameter, where the number after -m specifies the amount of memory in Megabytes (must be greater than 32). The following example starts Helix Universal Server as an application:

```
Bin/rmserver rmserver.cfg --hbi <Server IP Address>-m 512
```

The next example starts Helix Universal Server as a background process:

```
Bin/rmserver rmserver.cfg -m 512 & --hbi <Server IP Address>
```

Verification of Unix and Windows Start Up with --hbi

The command line in the console window will display this message:

```
Option: Heartbeat IP: 197.168.0.100
```

Troubleshooting StartUp with --hbi

Most problems involving the hbi can traced to the wrong IP addresses being assigned to this monitoring mechanism. It is possible to incorrectly type in the IP address, and have the hbi mechanism heartbeat another active server on the network. Signs that another server, other than the Helix Universal Server, may be involved could include spontaneous reboots of the Helix Universal Server when the other server is take offline or fails. Similarly, if another server is being monitored by the hbi and it goes offline, the warning message in step 3 above will appear in the Server's console window.

To fix this problem go back into the Bin/rmserver rmserver.cfg --hbi <Server IP Address> file and check to see that the <Server IP address> is correctly entered as the IP address you assigned to the Server.

Step 11: Starting Helix Universal Proxy After A Shutdown

This section describes how to start Helix Universal Proxy on Windows and Unix. It lists command line options that you can use when starting Helix

Universal Proxy manually. Unlike the second start up of Helix Universal Server, no changes will need to be made to the configuration. This procedure starts the application after is it has been previously shutdown.

> **Note:** When you start Helix Universal Proxy manually, you can select which configuration file you want to use. You can also specify command line options on both Windows and UNIX. Starting on Windows

Since you did not install Helix Universal Proxy as a Windows service, you can start it from the **Start** menu, a desktop icon, or the command line.

Starting Up from the Start Menu

From the **Start** menu, select **Programs>Helix Proxy.** Helix Universal Proxy loads the default configuration file, `rmproxy.cfg`.

Starting Up from the Command Line

From the **Start** menu, open the command prompt. Navigate to the `Helix Proxy` folder, and enter the following command to start Helix Universal Proxy with its default configuration file. You can use a different configuration file if you wish:

`Bin\rmproxy rmproxy.cfg`

Starting on UNIX

You can start Helix Universal Proxy as an application or as a background process. The following procedure uses the default configuration file (`rmproxy.cfg`), but you can specify a different file.

> **Note:** If you performed a default installation of Helix Universal Proxy, the RTSP port is set lower than 1024, requiring the user who starts Helix Universal Proxy to log in as `root`.

➤ **To start Helix Universal Proxy on UNIX:**

1. Start any command shell.

2. Navigate to the main Helix Proxy installation directory.

   > **Warning!** If you do not start Helix Universal Proxy from its `Bin` directory, it cannot understand the relative paths in the configuration file.

3. Choose one of the following options:

a. Start Helix Universal Proxy in the background with the following command:

`Bin/rmproxy rmproxy.cfg &`

b. Start Helix Universal Proxy as an application:

`Bin/rmproxy rmproxy.cfg`

c. Optionally, you can limit the amount of memory that Helix Universal Proxy uses by including the -m parameter, where the number after -m specifies the amount of memory in Megabytes (must be greater than 32). The following example starts Helix Universal Proxy as an application:

`Bin/rmproxy rmproxy.cfg -m 512`

Unix Start Up Verification

For UNIX installations you have successfully complete the Proxy installation when you see the following message:

`Start PID xxxx, procnum xx <Streamer>`

Windows Start Up Verification

For Windows installations you have successfully complete the Proxy installation when you see the following message in the console window:

`Start PID xxxx, procnum xx <Streamer>`

Troubleshooting Proxy StartUp

If you encounter problems during startup please consult the "Troubleshooting Helix Universal Proxy" chapter in the Helix Universal Proxy Administration Guide.

Additional Configuration Considerations

With the exception of the unique IP Addresses binding procedures for Helix Universal Gateway, described above, all other configuration tasks for the Helix Universal Server and the Helix Universal Proxy are the same as normal installations described in each applications' respective Administration Guide.

The following pointers below will direct you to instructions for configuring cache and communication port settings.

Configuring Ports on the Helix Universal Gateway

Configuring Helix Universal Server Ports

For More Information: See the "Sever Setup" chapter of the Helix Universal Server Administration Guide.

Configuring Helix Universal Proxy Ports

For More Information: See the "Firewalls" chapter of the Helix Universal Proxy Administration Guide.

Configuring the Caches on the Helix Universal Gateway

Configuring Helix Universal Server Caching

For More Information: See the "Multiple Server" chapter of the Helix Universal Server Administration Guide.

Configuring Helix Universal Proxy Caching

For More Information: See the "Proxy Setup" chapter of the Helix Universal Server Administration Guide.

Working with Helix Administrator

Helix Administrator is Helix Universal Server and Helix Universal Proxy's HTML-based, graphical user interface. It allows you to modify and manage Helix Universal Server from a browser anywhere on your network. Even though Helix Universal Server and Helix Universal Proxy have their own Administrators, the interfaces are identical for both.

For More Information: Go to the "Installation and QuickStart" chapter in the Helix Universal Server Administration Guide or the Helix Universal Proxy Administration Guide.

Adding Virtual IP Addresses to Windows, Solaris, and Linux Systems

These instructions for configuring adding additional IP addresses to specific systems is provided for your convenience. If problems arise during this process please consult your OS vendor's documentation directly.

> **Warning!** Your system must be configured with two or more IP addresses before install the server and proxy subsystem on one machine.

Windows 2000/XP Virtual Addressing

Adding additional static IP addresses for Windows is straightforward with following procedures;

➤ To configure TCP/IP for static addressing for Windows

1. From the **Start** menu, select **Settings>Control Panel > Network Connections.**

2. Right-click the network connection you want to configure, and then click **Properties.**

3. On the **Networking** tab (all other connections), click **Internet Protocol (TCP/IP)**, and then click **Properties**.

4. Click **Advanced,** and then click the **DNS** tab.

5. In **DNS server address ...**, type an IP address and then click **Add**.

6. Repeat step 5 for each IP address you want to add, and then click **OK**.

Solaris Virtual Addressing

With Solaris 2.x it is possible to configure multiple IP addresses for a single physical interface. This allows a machine with a single ethernet card to appear as an entire network of different machines.

In order to configure the lance ethernet (le0 or hme0) device to support more than one IP address, do the following:

1. Create entries in /etc./hosts for each histamine your physical machine will appear as.

   ```
   128.195.10.31  myhost
   128.195.10.46  myhost2
   128.195.10.78  myhost3
   ```

2. Create /etc/hostname.le0:n files that contain the hostname for the virtual host n.

   > **Note:** The hostname.le0:0 is the same as hostname.le0

```
/etc/hostname.le0   (Contains name myhost)
/etc/hostname.le0:1 (Contains name myhost2)
/etc/hostname.le0:2 (Contains name myhost3)
```
        or
```
/etc/hostname.hme0   (10/100Mbit/sec high speed interface)
 /etc/hostname.hme0:1
 /etc/hostname.hme0:2
```

> **Note:** The above changes will cause the virtual hosts to be configured at boot time.

You can also directly enable/modify a logical hosts configuration by running ifconfig directly on one of the logical hosts by using the le0:n naming scheme.

```
% ifconfig le0:1 up
% ifconfig le0:1 129.153.76.72
% ifconfig le0:1 down
```
 or
```
% ifconfig hme0:1 up
% ifconfig hme0:1 129.153.76.72
% ifconfig hme0:1 down
```

Linux Virtual Addressing

There following information describes setting up virtual IP addresses on a single Linux machine.

> **For More Information:** Visit "Setting up IP Aliasing on A Linux Machine a Mini-HOWTO" at http://www.tldp.org/HOWTO/mini/IP-Alias/index.html

Kernel Compile Options:
```
    Networking options  --->
            ....
            [*] Network aliasing
```

```
....
<*> IP: aliasing support
```

After compiling and installing your kernel with IP_Alias support, configuration is very simple. The aliases are added to virtual network devices associated with the actual network device. A simple naming convention applies to these devices being `<devname>:<virtual dev num>`, e.g. eth0:0, ppp0:10 etc.

> **For More Information:** The the ifname:number device can only be configured after the main interface has been set up.

For example, assume you have an ethernet network that supports two different IP subnetworks simultaneously. You also wish your machine to have direct access to both. You could use something like:

```
root# ifconfig eth0 192.168.1.1 netmask 255.255.255.0 up
root# route add -net 192.168.1.0 netmask 255.255.255.0 eth0
root# ifconfig eth0:0 192.168.10.1 netmask 255.255.255.0 up
 root# route add -net 192.168.10.0 netmask 255.255.255.0 eth0:0
```

To delete an alias, add a `-' to the end of its name, then refer to it. It is as simple as:

```
root# ifconfig eth0:0- 0
```

Gateway QuickStart Installation Option

These "QuickStart" procedures are for the advanced users familiar with configuration file editing to use specific IP addresses for the reception of incoming connections. Through this feature, you can select individual IP addresses to use.

➤ **To Install the Helix Universal Gateway**

1. Install Helix Universal Server using the binary setup file you downloaded and license file received from RealNetworks.
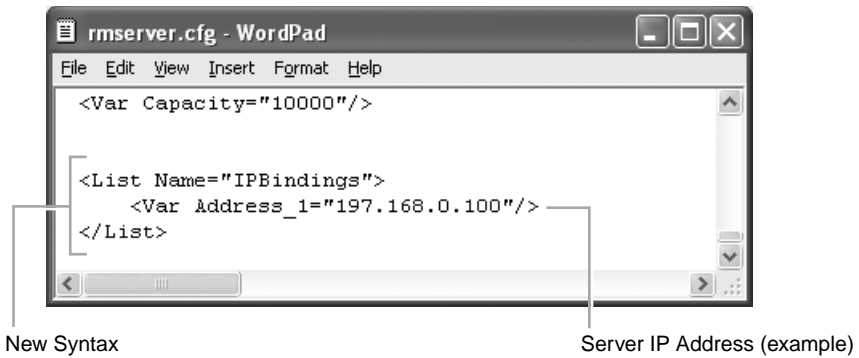
Figure 9: **Text editor view of server subsystem configuration file changes.**

2. Go to the directory you installed Helix Universal Server in and open the rmserver.cfg in a text editor.

    a. Add the following text to the rmserver.cfg file:

```
<List Name="IPBinding">
    <Var Address_01="197.168.0.100"
</List>
```

> **Warning!** The IP addresses *197.168.0.100* is used only as an example here. Your Server IP address should be different

    b. Save the file.

3. Install Helix Universal Proxy using the binary setup file you downloaded and license file received from RealNetworks.
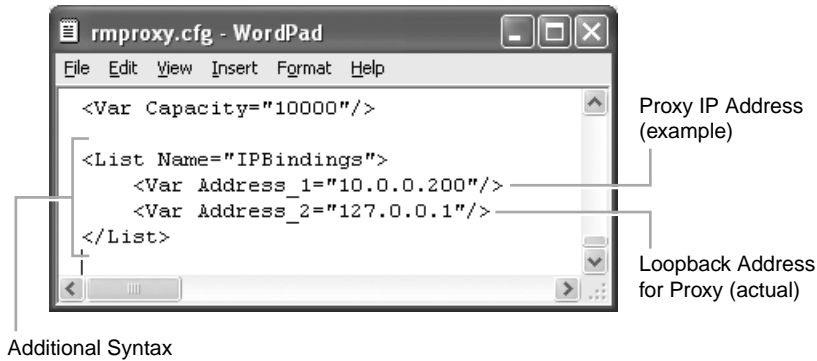
```
📄 rmproxy.cfg - WordPad                    [_][□][X]

File  Edit  View  Insert  Format  Help

 <Var Capacity="10000"/>                              ▲         Proxy IP Address
                                                                (example)
 <List Name="IPBindings">
     <Var Address_1="10.0.0.200"/> ──────────────────────
     <Var Address_2="127.0.0.1"/> ───────────────
 </List>                                              ▼
                                                                Loopback Address
 ◄   ▐▬▬▬                              ►                        for Proxy (actual)
```

Additional Syntax

Figure 10: Text editor view of proxy subsystem configuration file changes.

4. Go to the directory you installed Helix Universal Proxy in and open the rmproxy.cfg in a text editor.

   a. Add the following text to the rmproxy.cfg file:

   ```
   <List Name="IPBinding">
        <Var Address_01="10.0.0.200"
        <Var Address_01="127.0.0.1"
   </List>
   ```

   > **Warning!** The IP addresses *10.0.0.200* is used only as an example here. Your Proxy IP address should be different. The IP address of 127.0.0.1 is the correct address to enter for Var Address_02 (This is the loopback address, which is assigned to the Proxy during the installation of the Helix Universal Gateway.

   b. Save the file.

5. Start Helix Universal Server as an application with heartbeat interface (hbi) mechanism, using any one of these command:

   ```
   Bin/rmserver rmserver.cfg --hbi <197.168.0.100>
   ```

   > **Warning!** The IP addresses *197.168.0.100* is used only as an example here. Your Server IP address should be different.

6. Start Helix Universal Proxy normally.